UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/749,484	12/31/2003	Mathew G. Pelletier	0004.04	2121

25712 7590 10/26/2005

USDA-ARS-OFFICE OF TECHNOLOGY TRANSFER
NATIONAL CTR FOR AGRICULTURAL UTILIZATION RESEARCH
1815 N. UNIVERSITY STREET
PEORIA, IL 61604

EXAMINER	
NGUYEN, VINCENT Q	
ART UNIT	**PAPER NUMBER**
2858	

DATE MAILED: 10/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/749,484	PELLETIER, MATHEW G.	
	Examiner	Art Unit	
	Vincent Q. Nguyen	2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-4, 7-20, 22, 24, 25, are rejected under 35 U.S.C. 103(a) as being unpatentable over Larsen et al. (4,135,131) in view of Mounce (3,851,244).

Regarding claims 1, 7, 15, 17, 18, 24, Larsen et al. discloses a process for determining the moisture content of a material comprising (Figure 1) producing a primary microwave signal (20) with a varying frequency (Column 3, lines 39-40), said signal being a continuously varying signal, splitting said primary signal (By element 30) to provide first and second microwave signals (32, 34), said first signal (32) to be transmitted through said material (A) and said second signal (34) comprising an internal reference signal, transmitting said first signal (32) through at least a portion of said material, receiving at a receiver (38) a third signal which comprises potential multi-path interference signals (32a, 32b) and said first signal (32) which has passed through said material (A), mixing (element 40) said third signal together with said second signal, generating a mixed signal, filtering (Element 50) said mixed signal to remove substantially of said multi-path interference signals, generating a filtered-mixed signal measuring the frequency of said filtered-mixed signal to determine the propagation delay of said first signal after it has passed through said material (Column 4, lines 42-

47); wherein the frequency of said primary signal varies sufficiently rapidly that the frequency of said third signal and said second signal will be different when they are received at said receiver (Column 4, lines 15-22).

Larsen et al. does not disclose the step of calculating the moisture content said material from said propagation delay of said first signal after it has passed through said material.

Mounce discloses a system similar to that of Larsen et al. and further discloses the step of calculating the moisture content said material from said propagation delay of said first signal after it has passed through said material (Column 1, lines 5-24).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the step of calculating the moisture content as taught by Mounce into the system of Larsen because Mounce taught that: "The energy radiated from the first antenna passes through the paper web, it will be attenuated as a function of the moisture content of the web (Mounce's column 1, lines 19-22).

Regarding claims 2-4, Larsen et al. and Mounce do not specific disclose said material is selected from the group consisting cotton, hay, grain, tobacco, timber, lumber, and pulp.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the material such as cotton, hay, grain, tobacco, timber, lumber, and pulp into the system of Larsen et al. and Mounce because its material characterized by its dielectric constant and because Mounce taught that: "The energy radiated from the first antenna passes through the paper web, it will be

attenuated as a function of the moisture content of the web (Mounce's column 1, lines 19-22).

Regarding claim 8, although Larsen et al. does not explicitly disclose the microwave signal whose frequency is continuously varying is produced by a microwave voltage controlled oscillator with a continuously varying voltage source.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to recognize that the oscillator (Element 20) would have a voltage control oscillator with a continuously varying voltage source since almost oscillator must be controlled by the voltage control oscillator (VCO).

Regarding claims 9-11, 19, 20, 22, Larsen et al. does not disclose the VCO varies over a range of less than about 250MHz.

Mounce discloses a frequency range 100Hz (Oscillator 10) less than 250MHz (Less than 100Mhz, as in claim 10 and less than 50Mhz, as in claim 11) for the purpose of measuring the moisture content of a horizontally disposed damp paper web.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the frequency of less than 250MHz as taught by Mounce into the system of Larsen because Mounce taught that: "The greatest attenuation of microwave energy occurs when the exciting frequency corresponds to the natural resonant frequency of the molecules. One such absorption peak occurs in the band from 20 to 25 GHz (Mounce's column 1, lines 9-12).

Regarding claim 12, Larsen discloses sampling said mixed signal (Element 60) with an analog to digital converter to form a discrete sampled mixed signal filtering said

discrete sampled mixed signal with a digital filter to remove substantially all of said multi-path interference signals, thereby generating said filtered-mixed signal (It is inherent that Fourier analyzer must involve in analog to digital converter).

Regarding claim 13, Larsen et al. discloses determination of said propagation delay comprise the phase constant (Column 5, lines 5-7).

Regarding claim 14 and pertinence to the discussion of claims 1 and 12 above, Larsen et al. discloses the calibration (Figure 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate moisture content as taught by Mounce into the system of Larsen because of the same reason as set forth in claim 1.

Regarding claim 16, Larsen discloses first controlled repetition rate 2000Mhz (Column 6, lines 16) is greater than 1KHz.

Regarding claim 25, Larsen does not disclose a microprocessor for calculating the moisture content.

McEwan discloses a system similar to that of Larsen and further discloses a microprocessor (24) for calculating the moisture content.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the micro processor as taught by McEwan into the system of Larsen because using microprocessor to calculate the moisture content would enhance the calculation and is routine.

3. Claim 6 is are rejected under 35 U.S.C. 103(a) as being unpatentable over Larsen et al. (4,135,131) in view of Mounce (3,851,244), as applied to claim 1 above and further in view of Nelson (5,939,888).

Regarding claim 6, Larsen et al. and Mounce do not discloses a discrete time varying signal.

Nelson discloses a system similar to that of Larsen and Mounce and further discloses a discrete time varying signal for the purpose of enhancing the moisture measurement (Nelson's column 1, lines 13-24).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate discrete time varying signal as taught by Nelson into the system of Larsen et al. and Mounce because using discrete time varying would enhance the accuracy of the measurement of the moisture.

4. Claims 5, 21, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larsen et al. (4,135,131) in view of Mounce (3,851,244), as applied to claim 1 above and further in view of Moshe et al. (6,107,809).

Regarding claim 5, Larsen et al. and Mounce do not disclose the step of determining the transmission path-length of said first signal through said material, and wherein said moisture content is calculated from a calibration equation which utilizes said transmission path-length, said propagation delay, and said density.

Moshe et al. discloses a system similar to that of Larsen et al. and Mounce and further discloses the step of determining the transmission path-length of said first signal through said material (Column 11, lines 25-45), and wherein said moisture content is

calculated from a calibration equation (Figure 3) which utilizes said transmission path-length, said propagation delay, and said density for the purpose of enhance the calculation (Column 4, lines 30-58).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the step of determining the moisture content using component such as length/thickness of the material and calibration as taught by Moshe into the system of Larsen et al. and Mounce because it would enhance the calculation.

Regarding claims 21, 23, Larsen et al. and Mounce do not discloses the material comprising cotton.

Moshe et al. discloses a system similar to that of Larsen et al. and Mounce and further discloses the material comprising cotton.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the material comprising cotton bale as taught by Moshe et al. into the system of Larsen et al. and Mounce because Moshe et al. taught that: "These materials must be gathered, transported and stored before being used in the manufacturing process. The manufacturing process itself may require multiple procedures, first to prepare the raw material, and then to use the processed material in the formation of the actual product. Many of these procedures are dependent upon the moisture content of the material. If the moisture content is too high, for example, the material may decompose during storage and transportation, before it can be used."

Response to Arguments

5. Applicant's arguments with respect to claims 1-25 have been considered but are moot in view of the new ground(s) of rejection.

Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vincent Q. Nguyen whose telephone number is (571) 272-2234. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Vincent Q. Nguyen
Primary Examiner
Art Unit 2858

V. Nguyen

October 24, 2005